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The Veri-chrome system of tooth color selection by contrast...

These are the simple steps of the Veri-chrome system of tooth color selection by the "contrast" method.

First, without using the Veri-chrome guide, judge whether the tooth appears to be yellow or yellow-red. Next, estimate to what degree of that color the tooth is saturated.

Assume for the moment that the tooth appears to be yellow of approximate saturation No. 3 (Veri-chrome

Tooth Color Y3). ★ ★ ★ ★ ★
Now, using the Color Guide, use R/3 for comparison *instead of* Y/3 (see Fig. 1).

If the natural tooth appears to be yellow by contrast—then the original judgment of hue was correct. If it doesn't appear yellow by contrast—then the original judgment of hue was incorrect.

Assuming that the judgment of yellow color was correct, we proceed

to check the degree of saturation by the same method of contrast comparison.

The tooth was judged Y/3. Therefore, compare the natural tooth with Y/2, which is less saturated... or Y/4 which is more saturated (see Fig. 3).

By this method of *contrast-comparison*, both hue and saturation can be quickly and accurately determined. The simple selection by con-

FIG. 1

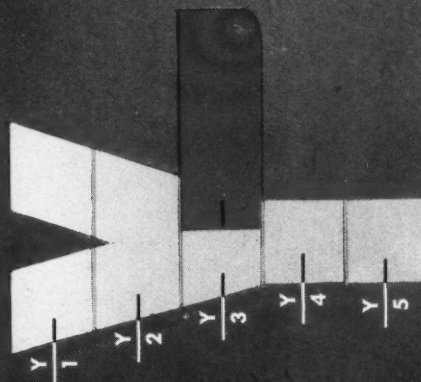
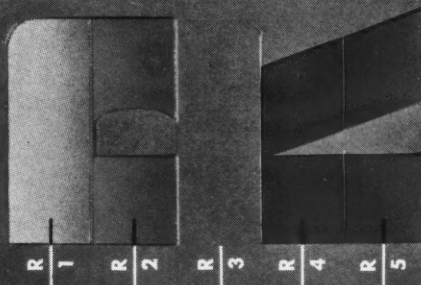
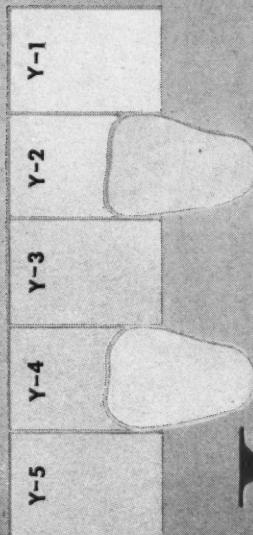


FIG. 2



ALL COLOR SATURATIONS SHOWN HERE ARE INTENSIFIED FOR EASIER PERCEPTION

FIG. 3



Veri-chrome

tooth colors now available in

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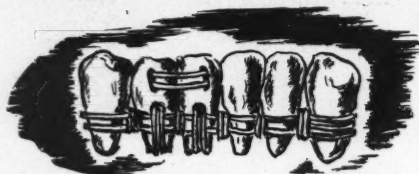
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In some quarters of the globe this belief persists even to this day. Usually tied in with sun-worship, the mouse is supposed to have definite magical properties, symbolized by its strong teeth. The ancients actually applied the animal directly to the affected parts and went on their way happy in the assurance that a complete cure would be immediately forthcoming!

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708 Church Street, Evanston, Illinois

B. F. DEWEL, D.D.S. (State University of Iowa, College of Dentistry, 1925) limits his practice to orthodontics. Doctor Dewel taught for four years in the Department of Orthodontics at Iowa, and has previously contributed to the dental literature. He presents here the first of two articles on the maxillary labial frenum. This month he discusses the developmental stages, anatomy, and normal variations of the frenum and premaxillary structures. The second article will appear in next month's issue.

About Our CONTRIBUTORS

STANLEY D. TYLMAN, A.B., D.D.S., M.S. (Notre Dame, and Northwestern University Dental School) is Professor of Prosthodontics, University of Illinois, College of

Dentistry. Last month Doctor Tylman described his technique for the use of resilient resins in complete and partial dentures. He now describes prostheses of the face and its related parts with the new resilient and elastic synthetic resins.

J. C. DEVINE, D.D.S. (Ohio College of Dental Surgery, Cincinnati) is engaged in oral surgery, roentgenography, and dental prosthesis. He presents THE USE OF ALLANTOIN AND SULFANILAMIDE OINTMENT IN EXTRACTION SOCKETS AND ORAL SURGERY.

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Contraindications for Surgical Resection of the Maxillary Labial Frenum*

B. F. DEWEL, D.D.S., Evanston, Illinois

DIGEST

The frequent association of an enlarged labial frenum with separated central incisors often has resulted in a faulty diagnosis involving unnecessary surgical resection of an innocent frenum and ultimate failure of the space to close. A thorough understanding of the recessive developmental tendencies of the frenum and of the many other causes of separated centrals will lead to a more rational treatment program.

Central incisors normally erupt with a space between them. Subsequent eruption of the laterals usually produces sufficient mesial pressure on the centrals to effect closure of the space and atrophy of an enlarged frenum, if present. If the laterals fail to close the space, the cuspids may, as a rule, be depended on to do so when they erupt. Thus the separation often may be considered a relatively normal condi-

tion up to the age of twelve.

Abnormal tongue pressure, lip habits, missing teeth, and malocclusion are among the causes of separated central incisors. When they are corrected, the frenum, if enlarged, tends to degenerate as the centrals move into contact following the removal of the cause of the separation.

If intermittent pressure produced by distending the upper lip results in blanching and definite movement of the palatal papilla, the frenum may be diagnosed as abnormal provided that all other possible causes have been eliminated and that sufficient time has elapsed for normal developmental forces to assert themselves.

An authentic abnormal frenum is a rare anomaly. Probably less than one in a decade will be observed in a private practice. Caution is advised against indiscriminate surgical resection.

THE LABIAL frenum as a cause of the separation of the upper central incisors has been given an emphasis not in accord with clinical observations or laboratory findings, with the result that many frenums actually within the range of normal deviation have been subjected needlessly to surgical resection. Little recognition has been given to the observation that most of these cases are either self corrective or would more readily respond to proper physiologic pres-

sure as applied by orthodontic procedures. Nor has sufficient attention been given to the many other causes of separated central incisors. A thorough understanding of the inherent growth and developmental patterns of the frenum and its associated structures will lead to a more rational therapy.

It must be remembered that it is normal for the central incisors to erupt with a space between them; careful study of roentgenograms disclose that when they develop in their crypts they are separated by the median suture of the maxillary

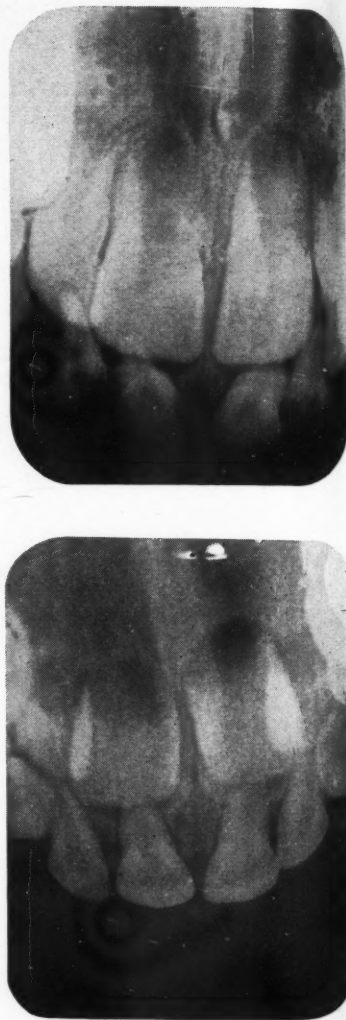


Fig. 1—Upper central incisors, unlike other teeth, develop in crypts separated by an articulating suture. Of necessity they erupt with a space between them.

bones (Fig. 1). If given sufficient time for development, they ultimately will come in contact through normal growth processes. It is during this immature, transitional period that the frenum most frequently is condemned as the cause of the separation of the upper central incisor teeth.

*This is the first of two articles on the maxillary labial frenum. The second will appear in the July issue. It will consider causes and treatment of separated central incisors and the diagnostic tests for normal, enlarged, and abnormal labial frenums.



Fig. 2—Eruption of laterals and cuspids provides the mesial pressure necessary to bring centrals into contact and to produce atrophy of an enlarged frenum, if present.

Developmental Stages of the Normal Frenum

There is, however, ample evidence that the frenum rarely is the cause of this irregularity. It is a structure that is subject to change in form, size, and position throughout its various developmental stages, during all of which it demonstrates degenerative characteristics. During early embryonic life it is relatively so large that it appears to divide the developing alveolus into two parts at the midline.¹ In this stage it is united with the palatal papilla, the incisal tuft located later in the interproximal space di-

rectly to the lingual of the upper central incisors.² Before birth this cleft in the alveolar ridge has been obliterated by normal embryonic development, resulting in a union of the halves of the alveolar process. During this action the frenum is thrust outward to the crest of the alveolar ridge, where, although diminished in size, it maintains an appearance of being continuous with the palatal papilla. It usually retains this position until the eruption of the teeth.

As the deciduous central incisors erupt at a later developmental stage, there is a corresponding downward growth of the alveolar process which results in an increase in vertical height of the premaxillary structures. Normally this development creates a

division between the frenum and the palatal papilla, during which the frenum is left at a higher point of attachment in relation to the alveolar crest. It is probable, however, that the frenum does more than remain stationary as the teeth and alveolar process pass it in their downward growth. It is more likely that its lower attachment actually rises during this developmental process, inasmuch as the frenum is known to diminish in size as it increases in age.

The frenum, however, may persist in its low attachment to the alveolar crest during the eruption of the deciduous centrals. Provided that other growth and developmental factors are normal, this is still no cause for concern for the laterals and particu-

¹Tait, C. H.: The Median Fraenum of the Upper Lip and Its Influence on the Spacing of the Upper Central Incisor Teeth, *New Zealand Dent. J.*, 25:116 (September) 1929.
²Orban, Balint: *Oral Histology and Embryology*, St. Louis, C. V. Mosby Company, 1944, page 26.



Fig. 3

Fig. 3—The adult frenum normally appears as a thin, triangular, knife-edge fold of mucous membrane.

Fig. 4

Fig. 4—A broad frenum with well defined attachments is within the normal range of variation.

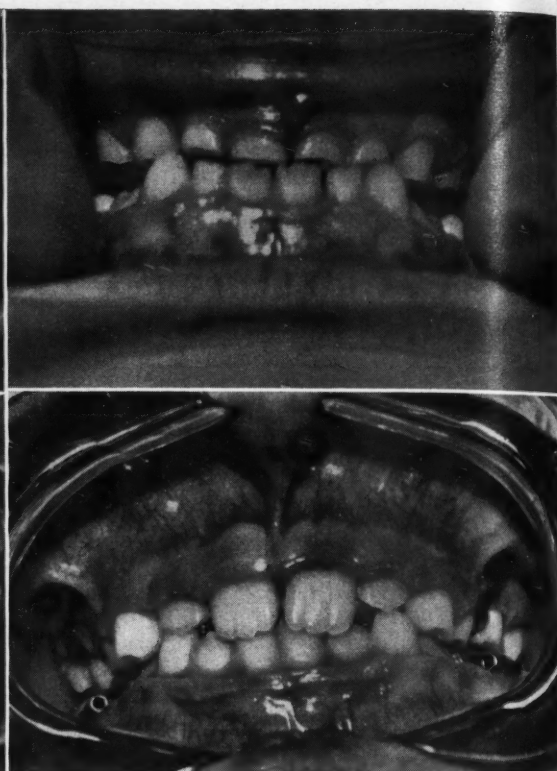
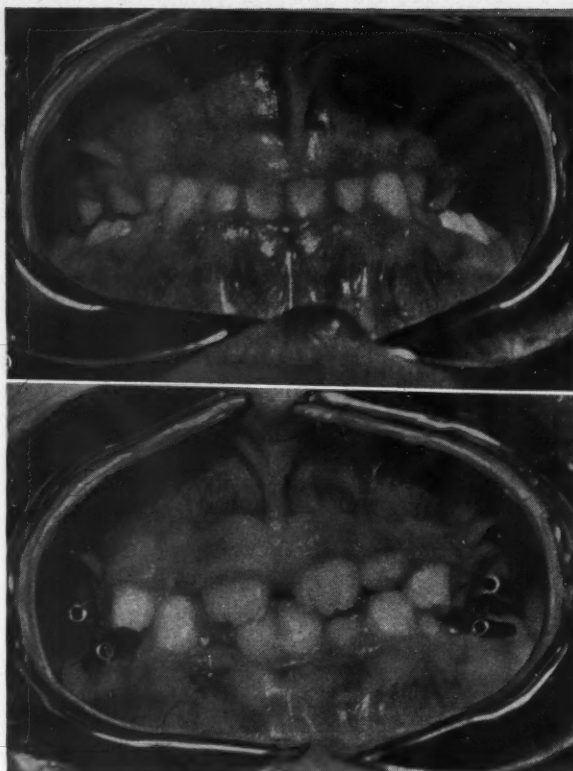


Fig. 5A (top) Fig. 5C (bottom) Fig. 5B (top) Fig. 5D (bottom)
 Fig. 5A—This photographic sequence demonstrates progressive degeneration of an enlarged frenum in a Class III malocclusion.
 Fig. 5B—The frenum presented a low, bulky attachment that extended into the interproximal gum septum.
 Fig. 5C—Downward and forward development of the teeth and process, during 10 months of orthodontic treatment, left the frenum at a higher point of attachment.
 Fig. 5D—Further degeneration of the frenum is evident following an additional 6 month period of normal development.

larly the cuspids in their subsequent eruption usually effect the closure by a wedging action, with the result that the frenum atrophies and thereafter is relatively unimportant (Fig. 2). This reaction may not be completed until the eruption of the corresponding permanent teeth. Consequently,

what may appear to be an abnormal frenum at the age of five will become a normal frenum at ten or twelve.

In these various stages it is apparent that the frenum is in reality an inert structure which does not develop or enlarge at the same rate as the alveolar process, and whose ulti-

mate size and position are determined for the most part by osseous and dental structures which surpass or excel it in growth and development. The validity of these developmental observations may be determined easily by a comparison of the relatively few separated central incisors observed



Fig. 6
 Fig. 7
 Fig. 6—In children the frenum is broad and strong with sturdy attachments to the lip and the alveolar process.
 Fig. 7—Harmless nodules frequently may be observed at various points along the crest of the frenum.



Fig. 8

Fig. 8—Frenums occasionally divide into two vertical folds or strands separated by a narrow channel.



Fig. 9

Fig. 9—The frenum sometimes may be located in a shallow groove formed between the roots of erupting central incisors.

in adults to the frequency of the condition found in children.

Anatomy and Histology

The normal appearance of the frenum in maturity is that of a triangular, thin, knife-edge fold of mucous membrane which rises from a relatively wide origin on the inner surface of the upper lip, extends posteriorly to a midline attachment on the labial aspect of the alveolar process, and terminates at a point 4 mm. or 5 mm. above the interproximal gum septum between the central incisors. Beneath its lower attachment the gingival tissues appear to be continuous (Fig. 3).

The frenum is composed almost

entirely of highly vascular white fibrous connective tissue covered superficially with stratified squamous epithelium. In the center of the structure the fibers are somewhat regular in arrangement with the strands running in an anteroposterior direction. At the anterior extremity they merge loosely with the fibers of the submucosa of the lip. At the midline alveolar insertion they blend likewise with the fibers of the outer layer of the mucoperiosteum and the connective tissue overlying the median suture. There are no muscular fibers in the frenum. Although it has no known function, it is able to adapt itself to any of the normal movements of the lip with little change in form.

Normal Variations

As with any other structure of the body, there are certain recurring variations in the normal frenum. Some are broad and sturdy (Fig. 4); others are narrow and membranous. One of its chief characteristics is its persistent variability in form, size, and position in the same person at different ages (Fig. 5), and in different persons of the same age. In the first of these conditions the tendency is recognized for the frenum to recede in importance as development progresses, while the second demonstrates the difficulty in determining proper diagnosis and treatment. This is particularly true when, as in children, the frenum ordinarily is broad-



Fig. 10—The median suture may be separated as widely with contacting centrals as with separated centrals, or it may be closed entirely when these teeth are spaced. The fan-shaped appearance of the laterals is normal in early developmental stages.

er and coarser than in adults (Fig. 6) and usually extends almost to the palatal papilla.

A variation frequently observed is the presence of a small nodule attached superficially near the middle of the crest of the structure (Fig. 7). It is not associated with any particular type of frenum, nor is it constant in size or location. A double effect, or bifurcation, occasionally may be seen, in which the septum is divided into two vertical folds of tissue separated by a channel or groove little more than a millimeter in width (Fig. 8). If a nodule is present on this type of frenum, it is on one side of the channel only.

The frenum sometimes may appear to have been torn or ruptured, probably in an unrecalled accident, resulting in a flap that hangs loosely from the point of rupture.

At birth and prior to the eruption of the deciduous teeth, a notch or slight depression is usually present near the midpoint of the alveolar crest at the junction of the frenum and the palatal papilla. In the developing denture, the frenum sometimes is located on the labial alveolus in a vertical concavity or shallow groove formed between the roots of the central incisors (Fig. 9).

The frenum, however, has not been known to have caused a separation of the maxillary bones by penetrating the midline suture of the premaxillae.



Fig. 11—A labial extension is an infrequent variation of the otherwise stable palatal papilla. It degenerates as development proceeds.

The frenum and the suture seem to have little or no relation to each other. Roentgenograms show that the suture may be as widely separated in the presence of a normal frenum with contacting centrals as it is with an enlarged frenum and separated centrals. Conversely, the suture may be closed entirely in the presence of separated centrals (Fig. 10).

In the adult the suture area frequently seems to be continuous, presenting a more or less calcified midline union of the two maxillary bones. In children it may take on the appearance of a distinct gap in which the alveolar crest comes to two points, one on each side of the opening. This may be seen as often with contacting centrals as with separated centrals.

None of these variations presents serious complications. They are simply modifications which may be observed occasionally, but which in themselves have no detrimental effect on the denture.

The palatal papilla is a much more stable landmark. It shows little change in form or position from its earliest fetal appearance, through childhood, and on into the adult denture. An infrequent variation is that at certain periods during development it may extend labially between the central incisors. In this variation its fibers do not unite with those of the normal frenum. This enlarged labial portion atrophies as normal development proceeds, leaving no trace in the adult denture (Fig. 11).

(To be concluded in the July issue)

ANNOUNCEMENT OF BOOKS RECEIVED

- ATLAS OF THE MOUTH, By Maury Massler, D.D.S., M.S., and Isaac Schour, D.D.S., Ph.D., D.Sc., First Edition, Chicago, American Dental Association, 1944.
- THE DENTAL TREATMENT OF MAXILLO-FACIAL INJURIES With Supplementary Material on Cases and Techniques, By W. Kelsey Fry, P. Rae Shepherd, Alan C. McLeod, and Gilbert J. Parfitt, First American Edition, Philadelphia, J. B. Lippincott Company, 1944.
- THE IMPACTED LOWER THIRD MOLAR, By William E. Durbeck, A.B., D.D.S., First Edition, New York, Dental Items of Interest Publishing Company, Inc., 1944.
- HUMAN CONSTITUTION IN CLINICAL MEDICINE, By George Draper, M.D., First Edition, New York, Paul B. Hoeber, Inc., 1944.
- MANAGING YOUR MIND: YOU CAN CHANGE HUMAN NATURE, By S. H. Kraines, M.D., and E. S. Thetford, First Edition, New York, The Macmillan Company, 1944.
- THE ANSWER IS . . . YOUR NERVES, By Arnold S. Jackson, M.D., F.A.C.S., First Edition, Madison, Wisconsin, Jackson Publications, 1944.

Clinical and Laboratory Suggestions*

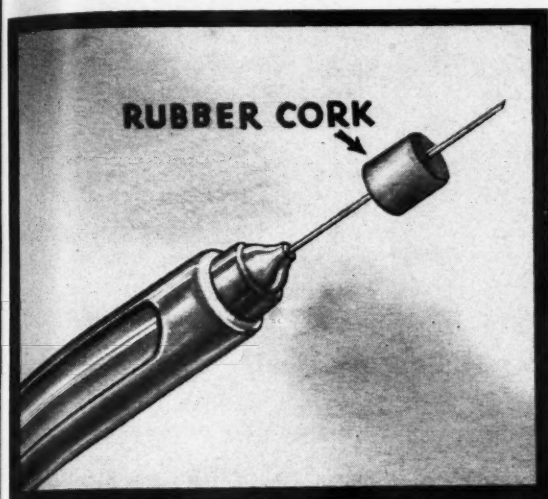


Fig. 1—The rubber cork from an anesthetic cartridge makes an effective safety stop in making an injection when shoved $\frac{3}{4}$ inch over the point of a long mandibular needle.

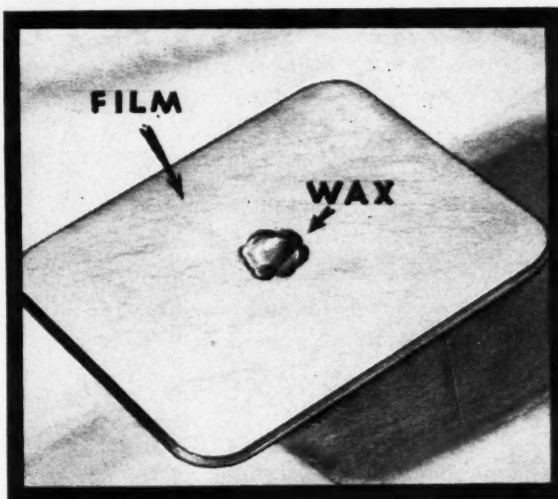


Fig. 2—A drop or two of pink wax on the center of a film provides a guide for deft fingers or clumsy thumbs in centering the x-ray film.

Fig. 3—An 8 inch length of floss silk, one end of which is tied around the middle of a cotton roll, may be drawn between the teeth and held firmly in position by the patient.



*From *Suggestions, Dentistry—A Digest of Practice*, 4:375 (February) 1944.

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Resilient and Elastic Resins: Technique for Their Use in Maxillofacial Prostheses

STANLEY D. TYLMAN, A.B., D.D.S., M.S., Chicago

DIGEST

The dentist is well qualified to construct prosthetic appliances for the face and head because of his technical skill and familiarity with the materials used, and his knowledge and training in the biologic sciences. This field of service is opening wider for him with the increase in the number of people demanding prosthetic treatment as the result of both civilian and wartime casualties.

A technique is described for the use of resilient and elastic resins in constructing a partial prosthetic ear. The history of the various types of artificial maxillofacial restorations is discussed, and the uses and requirements of these prostheses are listed.

LAST MONTH the technique was presented for the use of elastic and resilient synthetic resins in complete and partial dentures.¹ The present article describes the uses of such resins in prostheses of the face and its related parts. In an earlier paper² I reported the use of elastic and resilient resins for more than two years in dentures and in the reconstruction of noses, ears, and other anatomic parts of the body. Mention is made of these articles because during the last several months reports have appeared in the dental literature^{3,4,5} describing the



Fig. 1—Early latex prosthetic ears.

uses of elastic resins for facial prosthesis by authors who apparently are unaware of the pioneer work reported in this country.

History of Maxillofacial Prostheses

Historians report that maxillofacial prostheses were attempted as early as the sixteenth century. Fauchard and Delabarre are reported to have made appliances to restore destroyed and congenitally missing parts of the mouth and face. These appliances, for

the most part, were crude, partly because of the lack of a sufficiently high degree of technical skill, and more because of a lack of suitable materials with which to make the restorations esthetically pleasing, hygienic, comfortable, and compatible with the contiguous tissues. The prostheses restoring noses, ears, and other parts of the face have improved rapidly during the last twenty-five years with the increase in knowledge of the anatomy of the human head and neck and of the physiologic functions of their various parts, and with improvement in the materials made available to the dentist. Today it is possible to simulate nature to a high degree with the use of the synthetic resins.

The pioneers in this field of service employed metals, vulcanite, and even celluloid to make ears, noses, cheeks, and lips.^{6,7,8} Although these materials

⁶Olinger, N. A., and Axt, E. F.: Surgical Prosthetics of Oral and Facial Defects, *Am. J. Surg.*, 31:24 (January) 1936.

⁷Olinger, N. A.; Katz, Theodore; and Singer, Leon: Facial Prosthetic Reconstruction, *D. Survey*, 20:232 (February) 1944.

⁸Axt, E. F.: A Case of Surgical Prosthesis, *D. Cosmos*, 69:828 (August) 1927.

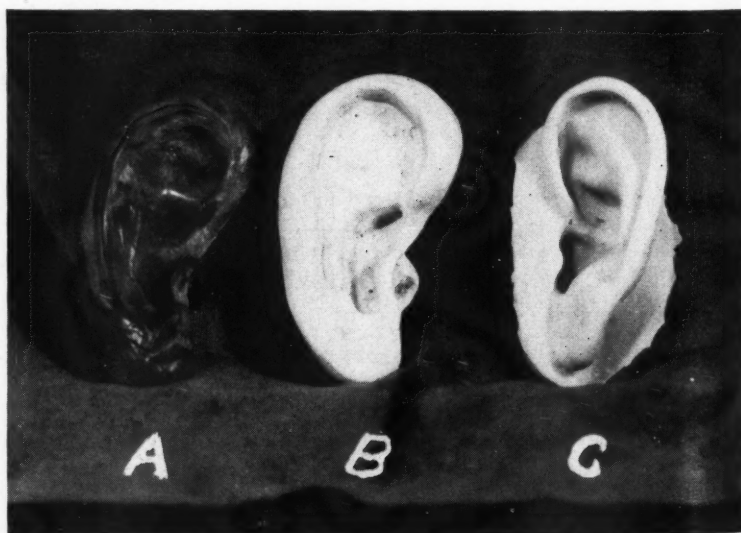


Fig. 2—A and B, First resilient resin ears made for a patient in 1941; A, transparent vinylite resin; B, filled with an opacifier and colored; C, Modern, improved resilient resin.

¹Tylman, S. D.: Resilient Resins: Technique for Their Use in Complete and Partial Dentures, *THE DENTAL DIGEST*, 50:204 (May) 1944.

²Tylman, S. D.: The Use of Elastic and Resilient Synthetic Resins and Their Copolymers in Oral, Dental, and Facial Prostheses, *THE DENTAL DIGEST*, 49:167 (April) 1943.

³Hume, L. R.: Prosthetic Restoration for Defects of the Ear Using Polyvinyl Chloride, *Australian J. D.*, 47:170 (September) 1943.

⁴Tuckfield, W. J.; Warner, H. K.; and Guerin, B. D.: Acrylic Resins in Dentistry, *Australian J. D.*, 47:172 (September) 1943.

⁵Sweezy, E.; Baxter, H.; and Copeman, R.: The Use of Acrylic and Elastic Resin Prostheses for Facial Deformities, *Canad. M. A. J.*, 50:16 (January) 1944.

were durable and strong, they lacked the texture and translucency of the skin and tissues; they gave the restoration a hard, nonflexible appearance. Efforts toward creating a tissue-like flexibility of the restorations led to the development and use of a gelatine-glycerine mixture by several workers in this field.^{9,10} Although flexibility and an improvement in the coloring were obtained with this material, the restorations were not permanent; their perishability required frequent replacements.

The development of prevulcanized liquid latex offered the next improvement in facial prosthesis (Fig. 1). Bulbulian^{11,12} developed the technique whereby the liquid latex is poured into a dried plaster or stone mold made from a carved wax model of the ear. The latex, when left in the mold and exposed to oven heat for a given length of time, is vulcanized, and the appliance comes out soft and resilient. Zinc oxide and dyes are added to obtain the desired color and translucency. The appliance may be made solid or hollow. Creditable results have been obtained with this material and technique. It has, however, one disadvantage: the relatively large amount of shrinkage that takes place during the vulcanizing of the latex. This necessitates an enlargement of the wax model, and makes it difficult to obtain a correct peripheral fit of the appliance to tissues without considerable adjusting. This technique is still the method of choice of some men engaged in this work.¹³

With the advent of the new acrylic



Fig. 3—Lower portion of right ear missing.



Fig. 4—Plaster impression in two sections of disfigured ear.

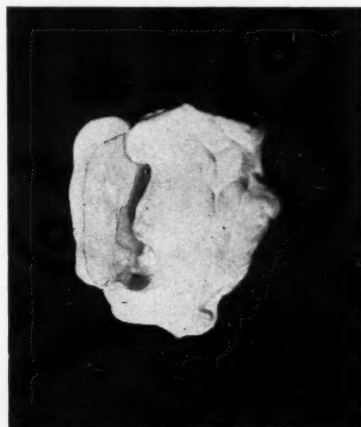


Fig. 5—The sections of plaster impression should be keyed and lubricated so that they can be reassembled properly.

denture base materials, this resin was used in constructing ears, noses, and other parts of the face.^{14,15,16,17} This material still fell short of the ideal although it possessed many desirable qualities. Recently Dietz^{18,19} demon-

strated the use of hard acrylic resins in constructing hollow ears (Fig. 2). These were light in weight because of their shell-like structure. Dietz was able to obtain a natural-looking prosthesis by the unique laminating method which he used. His is the most refined method yet presented in the use of rigid materials when rigidity is not an undesirable factor and the whole ear is to be reproduced.

Use of Prosthetic Appliances

Individuals who are in need of facial prosthesis are found in every community; they may lack part or all of a nose, ear, chin, or cheek. These conditions may be congenital or may be acquired through accident or disease. The correction sometimes may be made by plastic surgical methods if the surgeon feels that the end result will be a cosmetic improvement and at the same time will restore function. If surgery is inadvisable or contraindicated, the correction may be made by prosthetic methods. During normal peacetimes, there is an unusual demand for prosthetic treatment as a result of automobile, industrial, and hunting accidents, and the demand for such service will increase tremendously as a result of wartime casualties. It is hoped that every dentist will be prepared to render such service to our returning veterans; not all casualties will be suitable subjects for plastic surgery.

Today we find many patients permanently disfigured as the result of

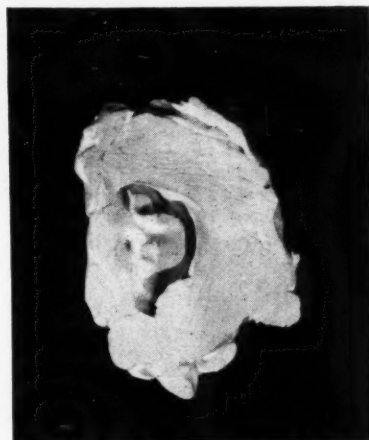


Fig. 6—Plaster impression of the other (normal) ear.

⁹Bercowitch, G. G.: Facial Restoration, D. Cosmos, 70:167 (February) 1928.

¹⁰Lederer, F. L.: Prosthetic Aids in Reconstructive Surgery About the Head, Arch. Otolaryng., 8:531 (November) 1928.

¹¹Bulbulian, A. H.: Prosthetic Restorations of Facial Defects by the Use of Latex Compound, Proc. Staff Meet. Mayo Clin., 14:721 (November) 1939.

¹²Bulbulian, A. H.: Repair of Facial Defects with Prosthesis Using a Latex Compound, J.A.D.A., 28:559 (April) 1941.

¹³Brown, A. M.: Correction of Facial Defects with Latex Prostheses, Arch. Otolaryng., 35:720, 1942.

¹⁴Munson, F. T., and Heron, D. F.: Facial Reconstruction with Acrylic Resin, Am. J. Surg., 53:291, 1941.

¹⁵Lowery, P. C.: The Use of Acrylics in the Construction of Splints and in Maxillofacial Prosthesis, J. Mich. State D. Soc., 25:157 (July) 1943.

¹⁶Nagle, R. J.: Maxillofacial Prosthesis, Am. J. Orthodont., 29:312 (June) 1943.

¹⁷Bigelow, H. M.: Facial Restorations, J.A.D.A., 30:509 (April) 1943.

¹⁸Dietz, V.: Acrylic Prosthetic Auricle; unpublished article presented at Am. Acad. Plastics in Dentistry (February) 1944.

¹⁹Dietz, V.: A Modified Methylmethacrylate for Somatoprosthetic Appliances; unpublished article presented at Am. Acad. Plastics in Dentistry, (February) 1944.



Fig. 7—Models: Clay (left); wax (middle); and metal (right).

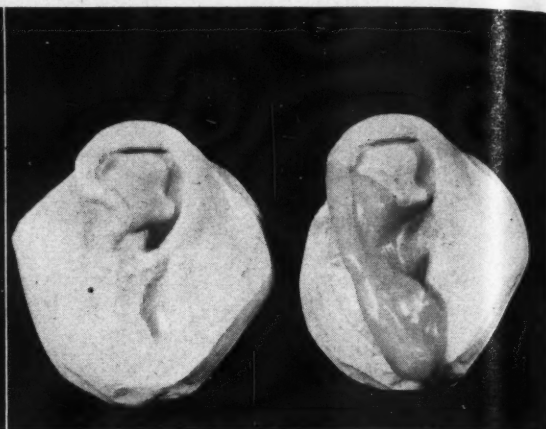


Fig. 8—Left: Stone duplicate of metal model of disfigured ear. Right: Wax carving of lower portion of ear in place on model.

tissue destruction by osteomyelitis, tuberculosis, necrosis, and syphilis, or as a result of operations for the removal of sarcomatous or carcinomatous tumors. It is frequently advisable to await the outcome of an operation to see if there is a recurrence of the malignancy before attempting further surgery. During this interval the patient is usually excluded from business and social contacts because of the disfigurement. Such a patient may be temporarily rehabilitated with a prosthetic appliance.

When parts of the face have been shot away and the surgeon is preparing and raising tissue pedicles for plastic surgery, many months may elapse before the facial wound has healed sufficiently to permit further surgery. During this time the patient often is not hospitalized but does not appear in public because of the disfigurement, which is usually covered with a large gauze dressing. A temporary facial prosthesis of the resilient resin is often indicated during the time interval before final plastic surgery.

At times plastic surgery may be contraindicated or may be impossible because of the age or physical condition of the patient which precludes a long series of operations. The location or extent of the wound may likewise contraindicate surgery. Furthermore, the patient may be unable to meet the financial obligations of hospitalization and may need a quick and painless but esthetically satisfac-

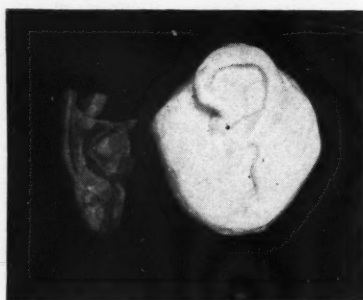


Fig. 9—Wax carving removed from model and ready to try on patient.

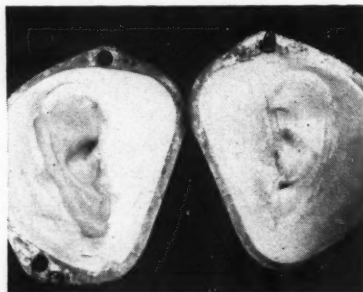


Fig. 10—Waxed model on stone cast invested in lower half (left) of flask preparatory to processing.



Fig. 11—Prosthetic portion of ear in place on patient.

tory result. Facial prosthesis serves another useful purpose: It may be used as an auxiliary to surgical treatment by acting as a frame over which the tissues may be stretched and shaped to the desired contour by the surgeon.

In addition to the knowledge and training which the dentist acquires in the biologic sciences, he is specially qualified to construct such prosthetic appliances because of his digital skill and his familiarity with the manipulation and physical properties of the materials used. Inasmuch as many of the patients needing such prosthetic service have previously received surgical treatment, it is recommended that close cooperation exist between the surgeon and the dentist.

Requirements of Prostheses

It is generally a simpler task to replace an entire ear or nose than to replace only part of one. The factors of retention, and the matching and blending of colors, are likewise less difficult when an entire prosthesis is made. Many standards have been set up for the ideal facial prosthesis and for the material of which it is to be constructed. The various requirements listed by writers include the following:

1. The prosthesis must be esthetically pleasing and must defy detection within a few feet distance. This means that the restoration must be properly contoured and positioned on the face or side of the head. It must be made



Fig. 12—Front view of cast of patient requiring nasal prosthesis.

of a material that approximates the texture of the skin and possesses the same degree of translucency as the natural tissues.

2. It must be comfortable and functional to the extent that it will aid speech (as in the case of the lip), and will not interfere with the sense of hearing or the sense of smell.

3. It should be so constructed and of such materials that it is hygienic and can be cleaned easily.

4. It should be sufficiently rugged and durable that it may be used daily, and should be replaced or duplicated

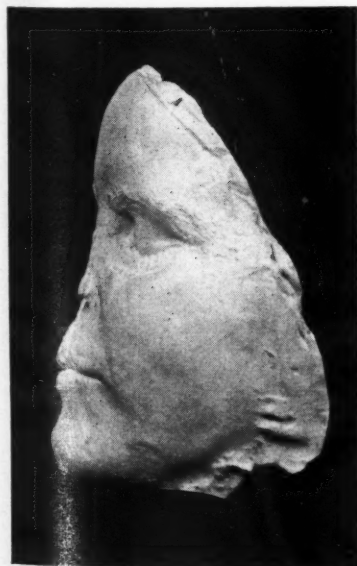


Fig. 13—Profile view of Fig. 12.

inexpensively. The ideal material is such that the prosthesis will maintain its form and fit permanently.

5. The ideal appliance is self retentive but, when this is impossible, the retentive means employed, whether mechanical or adhesive, should be simple and neat. If parts of the natural organ remain, they should be utilized to the utmost for retentive purposes.

6. In planning and designing the prosthesis, careful consideration should be given to the placing of the margins of the appliance in those areas and depressions where they will be inconspicuous. By proper treatment of the stone cast on which the prosthesis is processed, it is possible to obtain a slight marginal depression to help hide the peripheral margin.

7. The prosthesis should be easily adaptable to minor changes in color and contour. It is advisable for the patient to have spare prostheses for emergencies. One should be made to harmonize with the tanned skin in the summer, and another should harmonize with the skin color in winter.

8. It is important that the patient is willing to cooperate and to learn to use the appliance to its fullest advantage. Little difficulty is encountered in this respect inasmuch as all such patients are seeking relief from a physical, social, and psychologic handicap.

9. The ideal prosthesis requires a careful and complete examination of the patient, and precise execution of all the technical steps involved in its construction.

The prostheses relating to the head and face have been classified as follows by Olinger and Bulbulian:

Cranial Prostheses:

1. Frontal.
2. Occipital.

Facial Prostheses:

1. Aural.
 - a) Entire auricle.
 - b) Portion of auricle.
2. Nasal.
 - a) Entire nose.
 - b) Tip of nose.
 - c) Ala of nose.
 - d) Bridge of nose.

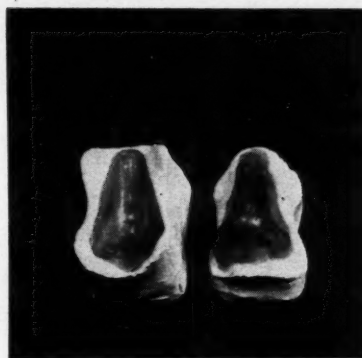


Fig. 14—Wax model of nose for cast shown in Fig. 12.

3. Labial.

- a) Upper lip.
- b) Lower lip.
- c) Lower lip and chin.

4. Orbital.

- a) Eye.
- b) Eye and cheek bone.

Technique in Constructing a Prosthetic Ear

The essential steps in the construction of any facial prosthesis are: (1) securing an accurate impression of the affected part; (2) construction of the model in wax or modelling clay; (3) construction of the prosthesis; and (4) attaching the prosthesis, and maintaining it in position. In the ensuing discussion the technique is given for the construction of part of an ear (Fig. 3).

1. If no undercuts exist, it is possible to take the impression in one

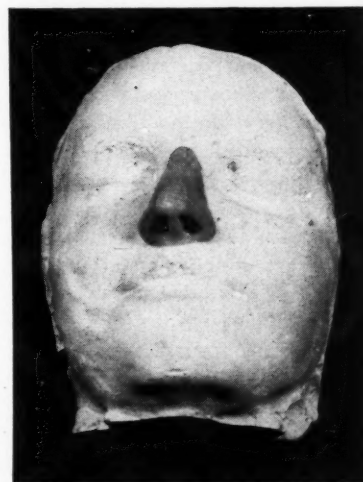


Fig. 15—Trial of wax model of nose on cast.

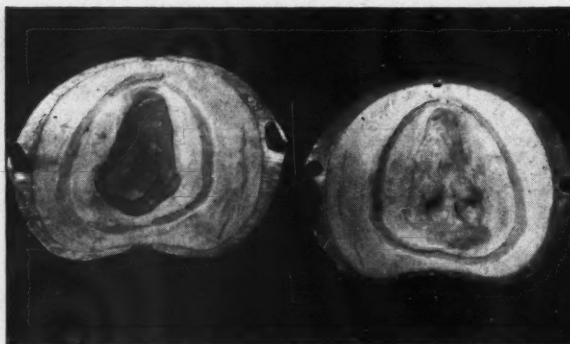


Fig. 16—Wax model of nose invested in flask.

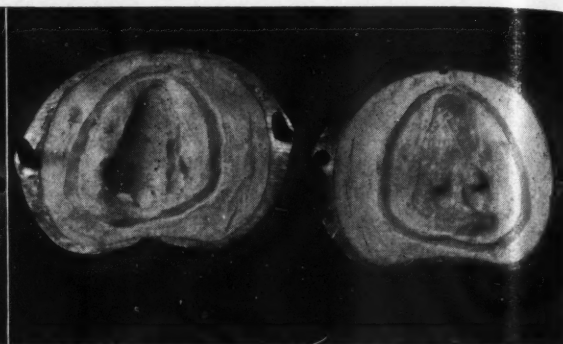


Fig. 17—Wax model of nose processed in resilient resin and ready for removal from flask.

piece in plaster, hydrocolloid, or alginate impression material, or with warm wax sprayed from a gun. A one-piece plaster impression may be used in the presence of undercuts provided that the undercuts exist in soft, yielding tissues which will pull out from the undercut area. If the undercuts exist in hard, unyielding tissues, it is safer to use the hydrocolloid materials. If only plaster is available, the impression should be taken in two or more sections (Fig. 4). The sections should be keyed and lubricated so that they can be properly reassembled (Fig. 5).

When taking impressions with plaster, it is sometimes necessary to limit its flow into undercut spaces. This is done by placing cotton, gauze, soft wax, or thick dough into these spaces. In taking impressions of the ear, cotton moistened with vaseline is placed into the external auditory meatus. If the nasal cavity and the turbinate bones are exposed, the flow of plaster may be limited by packing the space with wax, cotton, or dough. Rubber tubes are often inserted into the nostrils to aid the patient to breathe while the impression is being taken.

2. A similar impression is taken of the other (normal) ear (Fig. 6), and a low-fusing metal model is poured. The metal model of the sound ear reflected in a mirror serves as a guide in making the wax or clay model of the prosthetic ear (Fig. 7).

3. The plaster impression of the disfigured ear is likewise poured in low-fusing metal to provide a permanent indestructible model. This metal



Fig. 18—Profile view of finished prosthesis on cast; ready to be attached in place on patient with adhesive and aid of spectacles.

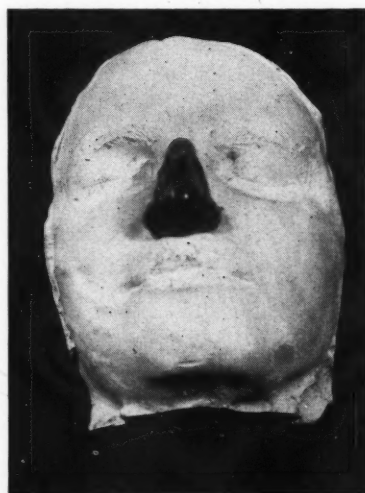


Fig. 19—Front view of Fig. 18.

model is placed in a duplicating flask and heated Korogel is poured over it

to give a pliable mold; any number of hard stone duplicates may be poured in this mold.

4. The wax or clay carving is then made on one of the stone duplicates (Fig. 8). Fig. 9 shows the wax carving removed from the model and ready for trial on the patient. If a large portion or all of the ear is being restored, this is the time to check the orientation of the wax model on its vertical axis and with reference to its auriculocephalic angle. It is well at this time to determine how and where the line of juncture between the appliance and the tissues may best be concealed. The preferred places are behind prominences and in natural shadows so that when viewed casually the margins will not be noticeable.

5. If satisfactory, the wax model is replaced on the stone model and is waxed carefully at its margins. The surface of the wax may be stippled with a stiff bristled brush so that it will simulate the texture of the skin.

6. The waxed model on the stone cast is then invested in the lower half of the flask as shown in Fig. 10. Separator is applied, and the upper half is poured in stone.

7. After the investment has set, the flask is placed in boiling water for four minutes; it is then removed and the halves are separated immediately. If the flask remains in the boiling water too long, the wax may melt and permeate the mold. All traces of wax must be removed with boiling water. While the investment is still hot, separating liquid is applied to all surfaces of the halves of the flask until the surface is glossy. The case is now

ready to pack with resilient resin. Inasmuch as the methods of mixing, packing, and processing of these resins were discussed fully in a previous article,¹ they will be omitted here.

8. After the prosthesis has been removed from the flask, and has been trimmed and fitted, it is ready for attachment to the tissues (Fig. 11). This may be accomplished by the use of adhesives such as "duo-cement" and "mastisol." The ear may be largely self retaining as a result of the natural configuration of the remaining stub of ear. Sometimes the temples of spectacles are helpful in retaining ears, and the bridge of the spectacles may help to retain an artificial nose in place. Many other ingenious devices have been developed for this purpose. The prosthesis must be attached so that it can move with the functioning surrounding tissues. Herein lies the great advantage of the resilient resins over the rigid materials. The series of illustrations, Figs. 12 through 19, show the steps in making a prosthetic nose.

Coloring the Prosthesis

When resilient resin is used in dentures, the color problem is relatively simple inasmuch as both soft and hard resins are furnished in the denture pink color. In facial prosthesis, matching, selecting, reproducing, and blending the colors of the resins with those of the natural tissues are more complex. A color known as neutral pink which may be used as the basic color in a large percentage of cases has been developed. To meet the requirements of lighter or darker

shades "plycor" is furnished in five other basic colors which may be modified further by the use of stains applied to the finished prosthesis. "Skin-tex" is furnished only in the neutral pink basic color polymer, but polymer stains in red, blue, brown, yellow, and white are also available. These enable one to reproduce almost any modification of the neutral pink color from a light, diluted effect to a deep intensified color. It is possible to match the basic color of almost any part of the face by preparing samples of wedge-shaped guides of different colors and percentage combinations.

Another difficulty arises in ear prosthesis: In an ear there are present not only different basic colors but different degrees of intensity of these colors. This difference in color intensity is due frequently to the varying tissue thickness. Furthermore, the color effect is modified by the translucency of the material. Our experience has been that the final matching and blending of colors is best accomplished by using water colors with an air brush on the finished prosthesis. The colors are then fixed by covering them with a transparent coating which provides a dull, skin-like finish. Although the basic colors may be selected with the aid of a color guide, the final air brushing is done with the prosthesis in place on the patient. Patients, especially women, become quite adept in giving the final touches with cosmetics. "Covermark" is used sometimes to help cover an exposed margin which could not be prevented.

DIGEST will allow \$25.00 toward the cost of the illustrations provided by the author of every article accepted.

About 20,000 of our dental colleagues are in military service. Few of them will have the time, the facilities, or the opportunities to develop new techniques or to write for the dental literature. They will be eager, however, to read of the new developments in dental science and art.

Writing articles for publication in technical journals can be a contribution to the war effort, because that is

Qualities Desired in Materials Used

The following qualities have been designated as desirable ones for the ideal material for facial prostheses:

1. Compatible with the surrounding tissues.
2. Soft and pliable like the skin.
3. Light in weight.
4. Translucent (not transparent nor too opaque).
5. Easily moldable.
6. Poor conductor of heat or cold.
7. Chemically and physically unaffected by sun, water, oils, heat, or cold.
8. Easily duplicated.
9. Inexpensive.
10. Little change in volume during processing.
11. Washable.
12. Surface texture not too smooth.
13. Wide range of plasticity.
14. Noninflammable.

The new resilient synthetic resins meet these requirements more closely than any other material available at the present time. The resilient resins and the methods of their use which are described here have: (1) unlimited possibilities in the range of their application; (2) relative ease of construction; (3) esthetic values; and (4) permanency.²⁰

²⁰As a result of the work of the author as reported in the April 1943 issue of *THE DENTAL DIGEST*, two nationally known, reputable manufacturers have each developed an elastic and resilient resin which is suitable for these types of facial prostheses. Doctor Fred Slack has directed the research in this new product for H. D. Justi & Son, Inc., of Philadelphia, and W. H. Sweeney and Harold Vernon have directed the research for the Vernon-Benshoff Company of Pittsburgh. The author wishes to acknowledge their helpful cooperation in this new and interesting phase of prostheses.

808 South Wood Street.

how to help our dental officers in the Army and Navy keep abreast of technical advancements, and it is one way to improve the skill and services of civilian dentists on the home front.

If you have a constructive idea, an innovation, a new result of tried and proved experiment, put it down in writing, illustrate it, and send the material to: The Editor of *THE DENTAL DIGEST*, 708 Church Street, Evanston, Illinois.

We hope that you will accept this invitation!

We Can't Pay You, But—

NO DENTAL author can ever be paid for a valuable technical or scientific article. The value of such material is above a monetary basis. In the preparation of a technical article, however, an author often expends money for drawings, photographs, models, or graphs. We would like to help defray some of these expenses.

Until further notice, *THE DENTAL*

The Editor's Page

WHEN THE DAY comes for the thousands of dentists who are now in military service to enter civilian practice, they will be confronted with many decisions. Some will wish to make a prompt return to their home communities. There will be those who will want to move to other cities and other states that offer greater opportunities. For many this will require taking another state board examination. It would be helpful if these dentists had detailed information concerning state board requirements and a knowledge of the type of examination required.

It would also be helpful if the dental opportunities in every community were evaluated. This kind of "opportunity census" has been done notably well by the Odontological Society of Western Pennsylvania. In the Pennsylvania study¹ information was collected regarding the number and the age of dentists in the communities studied as well as the facts pertinent to the patient-potential of the district. The Odontological Society of Western Pennsylvania, in this forward-looking study, had four major projects in mind: (1) to give the information regarding locations to dentists returning from military service; (2) to provide loan funds for the "starting-up period;" (3) to organize the mechanism whereby dental equipment might be supplied promptly to these dentists; and (4) to make patients available to the returning dentists. It is the sort of study that more dental organizations should undertake at local levels.

A number of dentists who will be separated from the Service will be entering practice for the first time. Not only will they need information regarding locations, but they will need information regarding office planning and layouts, and accounting and business methods. Many of the dentists in military service have offices to which they will return. A little dusting and housecleaning, and a notice to former patients, are all that will be needed to start in practice again. A great number of dentists, however, have moved their equipment to storage, and their old offices have been rented. It is con-

ceivable that in some of the large metropolitan areas there may be a shortage of office space until building is resumed. This will be a hardship to many returning dentists.

Most of the dentists in Service have been contemplating the day that they will re-enter civilian life. Many have decided that they are going to have offices different from the ones they left, possibly with two operating rooms, a bigger laboratory, or a bungalow type office. Now should be the time, therefore, for the architects who are specializing in dental plans to get busy and have blueprints available for the dentists at the moment of their discharge from military service.

Some of the resolutions made by dentists in Service have concerned their methods of conducting business affairs. They promise themselves that they are going to be more efficient in the future. This is the time for experts in accounting methods and office management procedures to develop plans.

Almost without exception, the men in military service will be interested in taking postgraduate and graduate courses before they re-enter civilian practice. Because the military dental mission is quite different from the civilian, dentists in military life will need a reorientation before they return to civilian life just as they needed orientation when they entered military service. These courses should be offered by a combined activity of the Government, dental societies, and dental schools.

The responsibility of postwar planning is too big for any one person. It should be a cooperative enterprise guided by the American Dental Association. The cooperating parties should include the Government, if necessary; dental schools; dental colleges; dental publications; dental trade associations; and people from allied professions and businesses. The American Dental Association has the talent, the leadership, and the resources, to be the coordinating agency. This is a project in postwar planning that is specific and concrete. It would be advantageous if all the information developed could be put together in a book, a copy of which would be made available to every officer upon his separation from the military service.

¹Craig, W. E.: Plans for Postwar Days, *ORAL HYGIENE*, 34:386 (March) 1944.

The Use of Allantoin and Sulfanilamide Ointment in Extraction Sockets and Oral Surgery

J. C. DEVINE, D.D.S., Norfolk, Nebraska

DIGEST

A carefully controlled clinical investigation of the topical use of sulfanilamide is reported. Tooth sockets and other wounds of the mouth in 378 patients were treated by three methods:

1. Sulfanilamide powder alone.
2. Sulfanilamide powder and postoperative medication of allantoin 2 per cent ointment.
3. Allantoin-sulfanilamide ointment and postoperative medication with allantoin 2 per cent ointment.

The use of the ointment which combines the valuable properties of allantoin with sulfanilamide in the water-miscible base was found to give best results.

THE ORIGINAL sulfonamide and later sulfanilamide, when first presented as therapeutic agents, were used internally in the treatment of bacterial infections. It was several years later before the topical use of sulfonamides was introduced. The failure to completely heal local suppurative lesions by oral administration of sulfanilamide and other sulfonamides was investigated, and reports soon began to appear indicating that more favorable results could be obtained by the direct introduction of the drug into the infected area.

Topical Application of Sulfanilamide

There have been many experimental and clinical reports which show a divergence of opinion as to which of the sulfonamide compounds is the best for topical application. Sulfanilamide was found to be most

effective in this method of treatment for the following reasons:

1. Local applications of sulfanilamide were more effective than other methods of antiseptics, and the drug was well tolerated.¹

2. Sufficient sulfanilamide powder could be placed in a wound to give a high local concentration without damaging the tissues or producing toxic systemic effects.² The incidence of infection was reduced from 27.2 per cent to 4.88 per cent.

3. The incidence of infection was lowered greatly by the implantation of sulfanilamide powder directly into traumatic wounds.^{3,4}

4. On the basis of solubility and diffusibility, sulfanilamide appears to be the sulfonamide of choice for topical application at present. It is absorbed more readily than the other sulfonamides, and the action of the drug in the wound does not extend beyond the depth of 3 mm.⁵

5. Evidence was reported that sulfanilamide diffuses rapidly through living tissue and fairly well through dead tissue. It has greater power of concentration and diffusibility than the other sulfonamides.⁶

6. The mere placing of the drug into the wound is not enough; it must enter into solution quickly and thus penetrate all portions of the wound. Inasmuch as sulfanilamide goes into solution quickly and in higher concentration than the other

sulfonamides, it is the drug of choice.⁷

7. Sulfanilamide appears to be least harmful to regenerating of tissue. It is the sulfonamide of choice for prophylaxis and treatment of contaminated wounds although local application of it may interfere to a certain degree with wound healing.⁸

8. Veal and Klepser⁹ reported that the instillation of 7.5 gm. of sulfanilamide powder into an open clean wound produced a peak concentration of the drug of 2 mg. per 100 cc. of blood within five hours, and that only small amounts were found in the blood after forty-two hours. According to Hodgson and Robinson¹⁰ the concentration of sulfanilamide in the blood after local application in traumatic and surgical wounds was usually in a concentration of 1 mg. per cent for each gram placed in the wound, provided the tissue from which absorption occurred was muscle which had good circulation.

9. The local implantation of sulfonamides in clean operative wounds is a safe procedure and lowers the incidence of operative infections.¹¹ Sulfanilamide or sulfathiazole, or a mixture of the two drugs, is suitable. An excessive amount of the drug may delay healing of the wound.

Objections to Topical Application of Sulfonamide Powders

1. It was reported that wounds treated with sulfanilamide powder became sluggish, pale, and dried-out in appearance. The wounds were in-

¹Baccaredda, A.: Sull'azione dei composti Solfamidici e Solfamidici in dermatologia, Gior. ital. di dermat. et. sf., 74:429 (April) 1938.

²Jensen, N. K.; Johnson, L. E.; and Nelson, M. D.: The Local Implantation of Sulfanilamide in Compound Fracture, Surgery, 6:1 (July) 1939.

³Key, J. A.; Frankel, C. J.; and Burford, T. H.: The Local Use of Sulfanilamide in Various Tissues, J. Bone & Joint Surg., 22:952 (October) 1940.

⁴Tendler, M. J.: Sulfanilamide in Surgery, J. Tenn. M. A., 33:300-305 (August) 1940.

⁵Ottenheimer, E. J.: Problems of Emergency Practice: Treatment of Wounds of Soft Tissue, Conn. State Med. J., 6:608 (August) 1942.

⁶Hawking, Frank: Local Concentration of Sulfonamide Compounds Inserted into Wounds, Lancet, 1:786 (June 21) 1941.

⁷Graves, C. Y.: The Local Use of Sulfonamides in Wounds, Kentucky Med. J., 40:430-433 (November) 1942.

⁸Long, P. H.: Sulfonamide Compounds in the Prevention and Treatment of Wound Infection, J.A.M.A., 121:303 (January 30) 1943.

⁹Veal, J. R., and Klepser, R. G.: Surgery, 6:947 (December) 1941.

¹⁰Hodgson, A. R., and Robinson, J. R.: Absorption of Sulfanilamide Applied Locally: Blood Levels in Forty-One Cases, Lancet, 2:392-394 (October 3) 1942.

¹¹Key, J. A.: Wound Healing and Infection After Local Implantation of Sulfonamide Powder, J.A.M.A., 122:1003 (August 7) 1943.

active and the healing time was prolonged even though the infection may have been controlled.¹²

2. Sulfonamides were found to produce inflammatory tissue reactions when implanted into wounds in dogs.¹³

3. The local application of sulfonamide drugs to wounds of soft tissue, or to clean-cut operative incisions in which primary suture was indicated, retarded healing by at least 50 per cent of the time and promoted extensive cutaneous scarring.¹⁴

4. When too finely powdered sulfonamide compounds are placed in a wound, they tend to "cake." Large crystals or coarsely ground forms of these drugs dissolve slowly in wounds and tend to imitate foreign body reactions.

Allantoin-Sulfanilamide Ointment

The physical form of sulfonamide and the vehicle in which it is dispersed are important factors to be considered in the topical use of these preparations. Many test experiments were made to determine the best possible vehicle for sulfanilamide.^{15,16,17}

It was found that the absorption of sulfonamides was retarded when they were incorporated with a grease, petrolatum, or oil base. They retained the medicament at the site but did not always allow intimate contact of the drug with the site of the infection; they did not mix with the exudate; they were sometimes removed with difficulty; and they probably permitted growth of bacteria under the film.

A combination of the valuable properties of allantoin* with sulfanilamide in a water-miscible base was found to possess healing and bacte-

riostatic properties.⁹ The ointment used, allantamide,¹⁸ consisted of 2 per cent allantoin and 10 per cent sulfanilamide incorporated into a water-miscible base which was free of oil or grease. The base contained glycerine, triethanolamine, stearic acid, and water. The glycerine increased the solubility of the sulfanilamide, and the triethanolamine acted as a surface tension reducer.

Further studies¹⁹ revealed that the success of treatment of chronic ulcers with comfrey root was due to the allantoin which was present in it in large percentages. It was likewise found that the unusual progress of healing with maggot therapy in chronic suppurative infection was due to the allantoin which is a constituent of surgical maggot secretions.^{20,21,22}

Veal and Klepser⁹ stated: "Microscopic evidence of greatly increased vascularity and healings seems to justify the addition of this drug (allantoin) to sulfonamide therapy in

certain instances." Gordon and Bernardin,²³ in a series of 250 cases treated with allantoin-sulfanilamide ointment, had only 7 per cent failures. These failures, they concluded, were due chiefly to the lack of cooperation on the part of the patients.

Method of Investigation

It is recognized that controlled observation of a drug is of greatest value if a study can be made in an institution in which a sufficient number of cases and properly controlled conditions are available. When sulfanilamide was first introduced to the medical and dental professions in 1936 as a prophylactic and therapeutic agent. We became interested in its use in powder form in the extraction pocket. Certain features of sulfanilamide powder prophylaxis and treatment which were not conducive to good results became evident, and an attempt was made to correct these objectionable features. We decided to continue the use of the sulfanilamide, but desired it in a form which would eliminate the undesirable features of the powder and which would nevertheless retain the bacteriostatic action and at the same time promote rapid healing.

The clinical research was carried out from January 1936 to January 1944. The controlled study was based on the use of:

1. Unsterilized sulfanilamide powder in all tooth sockets and other wounds of the mouth for three and one-half years.
2. Unsterilized sulfanilamide powder and postoperative medication of allantoin 2 per cent ointment for three years and eleven months.
3. Allantamide ointment in tooth sockets and wounds of the mouth and allantoin 2 per cent ointment as a postoperative measure for nine months.

Study Report

In all, 378 patients were treated. The conditions involved were: simple and multiple extractions; impacted third molars of tissue and bone type; chondromas, some attached to teeth; osteomas; gum resections in prepa-

¹²Veal, J. R., and Klepser, R. G.: Sulfonamide Therapy in Surgery, South. Med. J., 36:392 (April) 1943.

¹³Taylor, F. W.: Misuse of Sulfonamide Compounds, J.A.M.A., 118:959 (March 21) 1942.

¹⁴Rick, E. M.: Observations on the Topical Use of Sulfonamide Derivatives, J.A.M.A., 118:511 (February 14) 1942.

¹⁵Fuller, T. A.; Hawking, F.; and Partridge, M. A.: The Effect of Various Media on the Rate of Absorption of Sulfanilamide, Quart. J. Pharm. & Pharmacol., 15:136-147 (April-June) 1942.

¹⁶Kalz, F., and Prinz, M. V. N.: The External Use of Sulfonamides in Dermatology, Canad. M. A. J., 46:457 (May) 1942.

¹⁷Pillsbury, D. M.; Wamrock, V. S.; Livingood, C. S.; and Nichols, A. C.: The Local Treatment of Pyogenic Cutaneous Infections with Sulfathiazole in an Emulsion Base, Amer. J. Med. Sci., 202:802 (December) 1941.

¹⁸Allantamide ointment for this study was supplied by the National Drug Company of Philadelphia.

¹⁹Macalister, C. J.: A New Cell Proliferant: Its Clinical Application in the Treatment of Ulcers, Brit. Med. J., 1:10 (January) 1912.

²⁰Baer, W. S.: The Treatment of Chronic Osteomyelitis with Maggot, J. Bone & Joint Surg., 13:438 (July) 1931.

²¹Robinson, W.: Stimulation of Healing in Non-Healing Wounds by Allantoin Occurring in Maggot Secretions and of Wide Biological Distribution, J. Bone & Joint Surg., 17:267-271 (April) 1935.

²²Rattner, H.: Use of Urea in Hand Creams, Arch. Derm. & Syph., 48:41 (July) 1943.

²³Gordon, P. E., and Bernardin, J. A.: The Use of Allantoin-Sulfanilamide Ointment in Skin Infections, Med. Record, 157:25 (January) 1944.

*EDITOR'S NOTE: Allantoin—Glyoxyldiureid, Cordianine, 5-Ureidohydantoin. Mol. wt. 158.08, Nitrogen, 35.44 per cent. Discovered by Vauquelin and Buniva in 1800; synthesized by Grimaux from urea and glyoxylic acid, 1876. Found in tobacco seeds, sugar beets, wheat sprouts, about 0.8 per cent in comfrey; also in allantoin fluid, fetal urine, and excretions of maggots. Produced by oxidation of uric acid with alkaline potassium permanganate followed by acidification.

Colorless or white, lustrous, odorless, tasteless crystals or powder; optically inactive. Melts 230-236° with some decomposition. One gram dissolves in 190 cc. water, 500 cc. alcohol; more soluble in hot solvents, freely in alkalies; almost insoluble in ether. The aqueous solution is almost neutral to litmus.

Use: Like other alkaloids of the purine series, it influences diuresis, muscle action, and the central nervous system. Has been used internally in gastralgia and gastric and duodenal ulcers; externally to stimulate cell proliferation in 0.3-0.5 per cent aqueous solution for ulcers, nonhealing wounds, fistulas; also as powder applied by dusting or insufflation, and as an ointment. (From The Merck Index, ed. 5, Rahway, New Jersey, Merck & Co., Inc., 1940, page 16).

ration for dentures; cellulitis; cysts; a transverse fracture of the superior maxilla;²⁴ and a multiple fracture of the mandible.

The patients treated were divided into three groups: (1) 122 patients in whom a total of 1,115 teeth were removed were treated with sulfanilamide powder (unsterilized) alone; (2) 187 patients with a total of 1,971 teeth removed were treated with sulfanilamide powder (unsterilized) followed by postoperative medication of allantoin 2 per cent ointment; and (3) 69 patients with a total of 343 teeth removed were treated with allantomide ointment and postoperative medication of allantoin 2 per cent ointment.

Complete records were made to outline case histories, findings on physical examination, and postoperative results. We were interested in the following postoperative results: pain, edema, dry sockets, granulation of tissue, healing time, putrescence, reaction of the patient, and general condition of the patient.

Surgical Technique—1. A complete prophylaxis was given before any anesthetic was administered.

2. After the anesthetic (local) had taken effect, the mouth was irrigated thoroughly with warm saline solution. (If general anesthesia was to be administered, this was done before starting the anesthetic.) The wound was not irrigated during the entire surgical procedure.

3. Cotton rolls or exodontia sponges were placed around the operative site. The extractions were done in the usual manner, only three teeth being blocked off at a time. After the teeth had been removed, all sharp edges of exposed bone were filed or rongeured, debris was removed, and the gum tissue was trimmed.

4. Allantomide ointment was applied in the following manner:

a) A sterile, long-handled cement spatula or an applicator with the end wrapped in sterile cotton was used to carry the ointment from a dappen dish to the tooth socket.

b) After the socket was filled to overflowing, a sterile exodontia sponge which contained a liberal supply of allantomide was placed over the socket and pressed gently for five seconds to ten seconds.

c) The cotton rolls and sponges were removed and the patient was permitted to spit. The excess ointment and saliva were swabbed away gently from the wound which was then sutured.

d) In operations which required more time, such as removal of the bone type impacted lower third molar, allantomide was placed in the open wound immediately after the first incision was made, and as much allantomide as possible was kept in the wound during the operation. This kept the field of operation sterile and prevented contamination by saliva. Sponges or cotton rolls were kept in the field of operation to keep out as much saliva as possible.

5. When the operation was completed, all surfaces were swabbed clean, and sponges which contained a generous supply of allantomide and which were large enough to protrude from the mouth were placed over all surgical areas. The patient was directed to close the mouth over the sponges which were not removed for twenty minutes to thirty minutes.

6. An ice bag or a cold wet cloth was applied to the affected side of the face immediately after surgery had been completed; this was left in place for thirty minutes to an hour. The sponges containing allantomide were removed at fifteen minute intervals until a good clot had been established and hemorrhage had been controlled.

Postoperative Care—The patients were dismissed from the hospital with instructions as to diet and mouth care. They were not permitted to drink or to use cold liquids in any manner in the mouth for at least twenty-four hours, or until given permission to do so. When conditions permitted it, a warm saline solution was used as a mouthwash. Patients who were operated on under local anesthesia were seen one day to two days after surgery had been com-

pleted. Those who had been given a general anesthetic were hospitalized and were examined six hours to eight hours after the operation.

The entire oral cavity was examined, and the wounds were swabbed with exodontia sponges to ascertain if there was sufficient blood clot. The mouth was irrigated gently with warm saline solution. The sutures were examined and, if they were intact and if a well formed clot was present, allantoin ointment was applied and gently massaged over the entire area of operation. If a dry socket was present, it was curetted just enough to produce slight hemorrhage. An exodontia sponge containing allantomide was pressed into the socket. Slight pressure was maintained for ten minutes to fifteen minutes by having the patient bite down on it. This was continued until a firm clot was established, which usually required only two such applications of allantomide. If any teeth remained in the mouth, allantomide was worked well into the interproximal spaces. Allantoin ointment was applied to all surgical areas at each succeeding treatment until sufficient granulation was present.

Conclusions

1. Sulfanilamide, if properly applied in powdered form or when incorporated in a water-miscible ointment base (allantomide), prevents postoperative complications.

2. The use of allantomide will lessen the number of dry sockets. We had six dry sockets when we used powdered sulfanilamide alone and only one when we used allantomide.

3. The usual foul breath following extraction is not noted when allantomide is used. The use of sulfanilamide powder alone does not produce this effect.

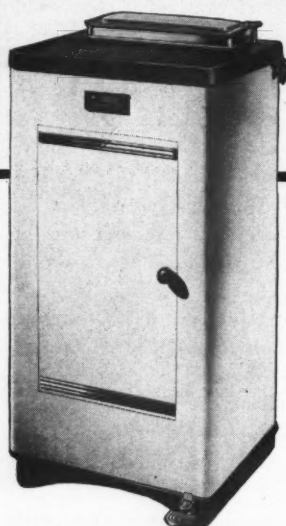
4. Allantomide has a solvent action on necrotic tissue, which is not observed when only sulfanilamide powder is used. The solvent action of allantoin probably accounts in part for so few dry sockets and the absence of a foul breath.

5. Tissue granulation is far more rapid when allantomide and allan-

²⁴Devine, J. C.: One of Those Unusual Cases, Cal. 4:4 (October) 1941.

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toin ointment are used than when sulfanilamide powder alone is used.

6. Allantomide adheres to the tissues of the wound for a much longer time than does sulfanilamide powder, resulting in a more prolonged action of the sulfanilamide.

7. In large open wounds, such as result from a complete upper or lower alveolectomy, the removal of an impacted third molar, or the removal of a cyst, the use of sulfanilamide powder is contraindicated. The large amount of sulfanilamide that would be necessary to fill the socket is often poorly absorbed, is washed away readily by the saliva, and has a tendency to "cake." The "caked" sulfanilamide powder becomes a foreign body and must be removed before healing can start. Such is not the case when allantomide is used because of its solubility in blood and its action in forming a healthy clot.

8. Allantomide can be carried to the tooth socket or other wounds in the oral cavity with greater ease and less loss of material than a powder; this is particularly true in the upper jaw.

9. General and local anesthetics were used. Two standard types of local anesthetics were used but no difference in action of the allantomide was noted.

10. Allantomide applied to the lips before surgery is an aid in preventing not only the corners of the mouth but the entire upper and lower lips from cracking as a result of the stretching of the lips by the retractor or other instruments.

11. In no case is the use of sulfonamide sufficient treatment whether it is used alone or admixed with some other preparation. Careful taking of histories, thorough physical examinations, and well planned postoperative care, are essential. The patient's physical condition must be watched as carefully as the wounds of the mouth, inasmuch as no wound will heal quickly and properly regardless of what drug is applied if the patient's physical condition is below normal.



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*Indeed they
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Contra- Angles



Railroads at War . . .

Every time I set foot in a train, I have gnawing guilt feelings. There are so many more people who should be traveling about other than civilians on their puny business errands. Trains are late, to be sure, and the food isn't what it used to be, but the railroads are doing a magnificent job. They are getting the military personnel to and from their stations, and they are getting the vital tools of war to the places where they are needed. Railroads are more, however, than men in overalls, more than rolling stock—they represent emotional highlights as well. There are moments of pathos in every railroad station in the world today—those heart-stirring moments of leave-taking.

I never step into a station to see one of these tense moments of parting without feeling like a gawking intruder. I try not to look or to be inquisitive in these tense moments in the lives of people, but one cannot help seeing some things: A mother presses a roll of bills into the marine's brown hand as he passes through the gate to be gone, maybe forever. And there is the father who tries to be so tight-faced and firm, who pats his soldier-son on the back when his throbbing inner emotion is to take the boy in his arms. There is the brave young woman, white of face and large with child, sending her husband away, not being sure if this child within her body will ever see his father.

And there are the happy moments. The boys returning from the wars with the proud ribbons on their chests, and being met at the gate by happy girls and parents. If one had the gift of storytelling, he could tell the throbbing inner life of the Nation by observing the emotions at the railroad stations in these war days.

Not an Easy Job . . .

In the larger dental societies in the country, the dentist who is elected to be president takes his office at a considerable sacrifice. The job is hard, it takes time away from his productive hours, and it is expensive in money out of pocket. But harder than the work and the expense are the personal irritations involved. Few men holding elective office in dental societies make friends through their jobs. Many of them, however, alienate their friends who feel that they are not getting the proper committee assignments or a place on the program.

The dental society member who takes office in the organization must do so with the clear knowledge that his popularity may be lessened rather than increased, that his business will suffer rather than be improved, and that the office will actually cost him money. Those of us in the membership should promise ourselves that we will support whomsoever holds the job of president; that we will do what we can to make his job easier and most successful; and that we will support even the fellow whom we do not like because we are more interested in the progress of dentistry and its good name than in the success or failure of any one person in the profession.

Touch of Modernity . . .

An imaginative innkeeper has done something to discourage the defacers of latrine walls. The pornography and crude characters that are written on these walls are for only short-lived inspection in this tavern keeper's place. For those people who have the gift of artistry during their moments in the latrine, this imaginative restaurateur has supplied a blackboard, a piece of chalk, and an eraser.

I do not know whether the members of the Restaurant Keepers Association of America (if there is such an organization) have ever discussed such momentous subjects at their meetings. If they haven't, it might be well if they invited this chap with the blackboard inspiration to appear and present a learned paper on "The



—that's what they tell us at dental meetings and conventions

At dental meetings and conventions, many dentists have stopped at our booth and remarked—"Yes, Hygienic sure has fine stopping." "I like it because it stays put."

Typical, too, are such comments as, "Hygienic is the best stopping I have ever used." "Hygienic Dental Stopping is just what I wanted. It is tough and resistant to attrition, yet is easier to manipulate than base plate gutta percha. It does the work beautifully."

You will be interested to know that Hygienic Stopping is made from an entirely new formula which provides it with these advantages never before combined in one product—

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Contains ingredients that are extremely tough and resistant to wear.

Stays in Place, Holds Shape

Because it is adhesive and inextensible, Hygienic Stopping stays in place and keeps its original form remarkably well.

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Smelling Out the Dead Beats . . .

Good advice is given to the dentist who wishes to prepare himself to detect dead beats at a glance or by a whiff. Lloyd H. Dodd of Decatur, Illinois, a member of the Council on Dental Health of the American Dental Association, has given us sensible advice.¹ He describes a credit granter as one who should have the following qualifications:

1. The curiosity of a cat.
2. The tenacity of a bulldog.
3. The determination of a taxi driver.
4. The diplomacy of a wayward husband.
5. The patience of a self-sacrificing wife.
6. The enthusiasm of a flapper.
7. The friendliness of a child.
8. The good humor of an idiot.
9. The simplicity of a jackass.
10. The assurance of a college boy.
11. The tireless energy of a collector of past due bills.

Doctor Dodd also describes thirteen types of patients who are to be watched with a particularly hard and merciless eye:

1. The individual who has only 100 days' work a year.
2. The man applying for credit who heretofore has always paid cash.
3. The man who takes no thought of tomorrow.
4. The charity credit.
5. The married person who lives beyond his means.
6. The person trotting in the "C.O.D. Fish Aristocracy."
7. The man who asks for credit on his supposed Christianity.
8. The patient who has a swelled head when asked for references.
9. The minor without an order from parent or guardian.
10. The shiftless young man without a bank account.
11. The person who holds out on charge accounts to pay installments.
12. The man not willing to tell you of his financial ability to pay.

¹Dodd, L. H.: Practice Management, Illinois D. J., 13:99 (March) 1944.



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Then remember that you're not *giving* anything. You're simply *lending* money—putting it in the best investment in the world.



Let's Go . . . for the Knockout Blow!

The Dental Digest

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council
JUNE, 1944

275

In your ORAL HYGIENE this month



Your Old-Age INCOME

Doctor Julius I. Gifford writes on this live topic in June ORAL HYGIENE, outlining specific plans for setting up a retirement income. The last time the postman brought Doctor Gifford a sheet of A.D.A. Relief Stamps, it set him thinking. This article is the result. Old-age security for dentists, by the way, is the subject of the current ORAL HYGIENE Opinion Poll, sponsored by Northwestern University. "My Twenty Years as a Naval Dental Officer" recounts in intimate terms the experiences of Commander George H. Reed (DC) USN. Now retired, he was the first officer designated "In Charge of Dental Affairs" in the Bureau of Medicine and Surgery, where he organized the Dental Division. In the Navy, his first dental office was an old chain locker. "A Dentist from Old Amsterdam Comes to New Amsterdam" is Doctor Herbert Loeb's story about

what happened to him when Nazi bombs drove him from the Netherlands to seek a new life in America. A small overnight bag is all that's left to remind him of his old home.

"Who Examines Your Patient?" is the plea of Doctor Victor H. Frank, distinguished Philadelphia dentist, for closer cooperation between physician and dentist for patient welfare. "Care of the Fighting Man's Mouth" was written for ORAL HYGIENE by Brigadier H. Stobie, L.D.S., Consulting Dental Surgeon to the British Army. Brigadier Stobie's authoritative article reveals why dental treatments receive new emphasis in this war.

This month's eight departments include Dentists in the News, Picture of the Month, Military News, Editorial Comment, Technique of the Month, Ask ORAL HYGIENE, Laffodonia, and The Publisher's Corner.

Oral Hygiene

13. The man who has already broken a promise to pay.

According to the United States Department of Commerce, as reported by Doctor Dodd, people vary in their account paying from cab drivers, who pay only 28.8 per cent of what they owe, to railroad employees, who pay 90.8 per cent of their bills. Dentists and physicians should not be too egotistical about their own paying habits. They drop between "unskilled female factory help" and "retail store salesmen." The dentist pays 69.5 per cent of his bills; the physician pays 69.8 per cent. The following list is based on percentage of accounts paid:

Railroad employees	90.8
Office clerks	88.2
Nurses	87.5
Accountants	85.8
Teachers	85.2
Municipal firemen	84.1
Municipal street railway employees	84.0
Mail carriers	81.0
Municipal policemen	80.5
Skilled male factory workers	79.6
Retail grocers	79.1
Retail butchers	78.9
Retail bakers	77.1
Plumbers	75.2
Clergymen	74.6
Retail store salesmen	71.5
Physicians	69.8
Dentists	69.5
Unskilled female factory help	68.8
Farmers	68.7
Gas station attendants	67.8
Unskilled male factory workers	65.8
Bricklayers and masons	65.4
Drugstore employees	65.1
Auto mechanics	64.0
Carpenters	60.2
Domestic servants	55.2
Hotel help	54.1
Lawyers	53.9
Barbers	53.6
Miscellaneous workers	53.4
College students	42.4
Painters and decorators	40.7
Restaurant help	34.8
Artists	32.2
Entertainers	29.3
Cab drivers	28.8

—E. J. R.

DENTAL MEETING

Dates

District of Columbia Dental Society, second Tuesday in each month, Medical Society Auditorium, Washington.

Connecticut Dental Commission, regular meeting, Hartford, June 20-24. For information write to Doctor C. G. Brooks, 302 State Street, New London.

New Jersey State Board of Dental Examiners, regular meeting, Trenton, June 28-July 2. For information write to Doctor J. Frank Burke, 150 East State Street, Trenton.

North Dakota State Board of Dental Examiners, regular meeting, Gardner Hotel, Fargo, July 10-13. For information write to Doctor R. A. Andrews, Secretary, Carrington, North Dakota.

Massachusetts Alpha Omegas, in service in this country or overseas, please communicate with Doctor Abraham Gurvitz, War Service Committee, Alpha Omega Fraternity, 371 Commonwealth Avenue, Boston.

National Dental Association, thirtieth annual meeting, New Central High School, Cleveland, August 14-18.

Ohio State Dental Board of Examiners, regular meeting, Western Reserve University, Cleveland, September 11-13; and at the Ohio State University College of Dentistry, Columbus, September 25-27. The practical examination for Dental Hygienists will be held at Ohio State University, September 26. The theory examination for both dentists and dental hygienists will be held in Columbus, September 28-30. For information write to Doctor Earl D. Lowry, 79 East State Street, Columbus.

(Continued on page 286)

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Don't repeat even little things about our war program unless they've been published or broadcast. Think before you talk!

Eruptive Fever Involving Mouth and Eyes: Report of Case

R. C. MURPHY, Jr., M.D.

A MAN, aged 22, was hospitalized three days after he had noticed a swelling between the upper lip and the gum tissue. Later blisters began to appear on the buccal mucous membrane. At the time of hospitalization the temperature was 101° F. The conjunctivas were diffusely inflamed. The buccal mucous membrane, gingiva, palate, and uvula were covered with many tight vesicles. There was a small amount of red inflammatory reaction and sticky exudate about the urethral meatus.

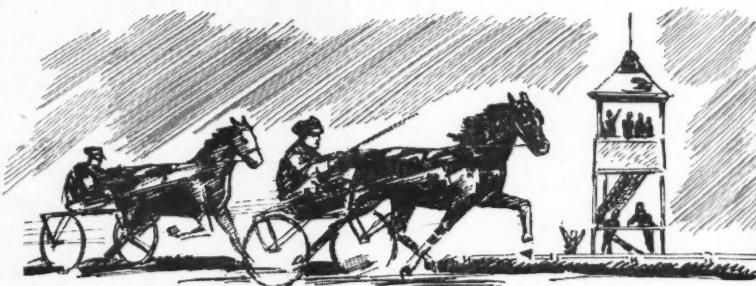
During the first two days of hospitalization the disease ran an alarming, fulminating course. The temperature rose rapidly to 104.6° F. All the pearl-like vesicles in the mouth ruptured, leaving a loose, dirty, whitish slough. By the third day there was a massive slough involving the entire mucous membrane of the mouth except the tongue. The nasal mucous membrane sloughed in a less dramatic manner. Large blebs with superficial sloughs appeared on the glans penis. Both conjunctivas were inflamed, but no vesicles formed about the eyes. A semipurulent exudate flowed continually from the eyes. Punctate red areas appeared and expanded on the arms and legs, and a vesicle appeared in the center of each area. These vesicles ripened into thin-walled bullas and ruptured.

On the fifth day the temperature fell and the patient began to improve. The sloughs in the mouth and on the penis were not complete before the third week. A conjunctival culture yielded *Staphylococcus aureus*. Smears of the bullas were negative for both eosinophilic polymorphonuclear leukocytes and organisms. No significant evidence of the heavy metals was found on qualitative tests of two twenty-four hour urine specimens. The patient had had an amalgam tooth restoration one and one-half months previously, but no other significant metal or drug history could be elicited.

The therapeutic measures included sulfadiazine for five days; the forcing of fluids; colonic irrigations; calcium gluconate intravenously; and salves, washes, and other local applications to the mouth, penis, and eyes. At the end of seventeen days the skin lesions had crusted and most of them had fallen away.

Nothing is known of the fundamental nature of the disease or of its etiology. Neither drugs nor Vincent's organisms had been implicated. The disease was not typical of erythema multiforme, and the enanthem rather than the exanthem was its constant feature.

—From Current Medical Literature, J.A.M.A., 124:1227 (April 22) 1944.



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—From *J.A.M.A.*, 124:503 (January 19) 1944.

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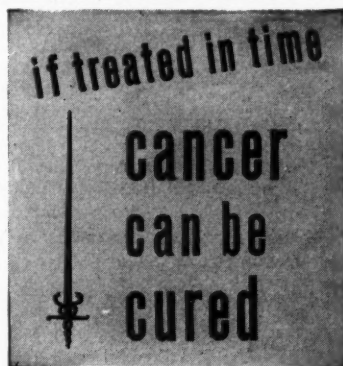
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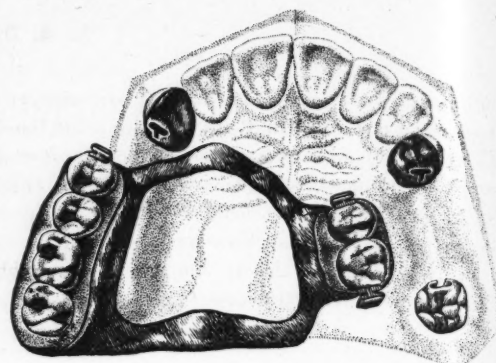
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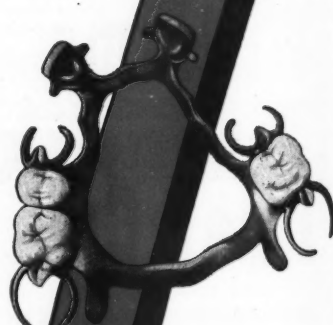
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—From Frahm, quoted by C. O. Flagstad.

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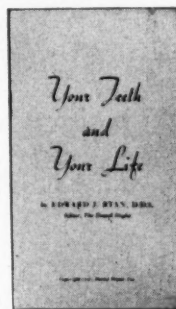
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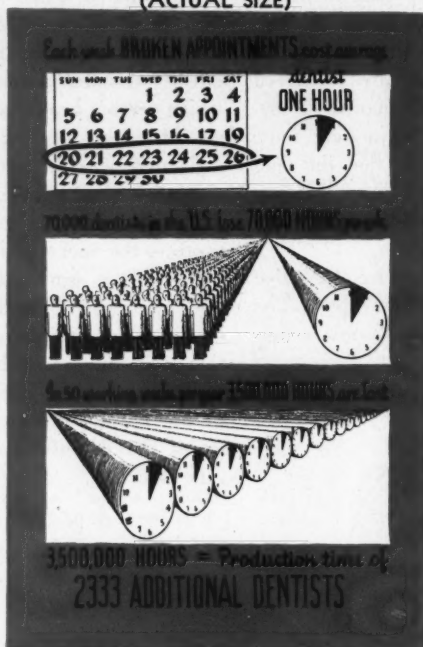
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